INTERNATIONAL CORAL REEF INITIATIVE

Recently, the International Coral Reef Initiative (ICRI) said it would secure public and private investment to help conserve and restore coral ecosystems.

About International Coral Reef Initiative:

- It was launched in 1994 by Australia, France, Japan, Jamaica, the Philippines, Sweden, Britain and the United States.
- Its **members now include 45 countries** that represent three quarters of the world's coral reefs.
- **India is** also a **member country** of this initiative.
- It is a global **partnership between Nations and organizations** which strives to preserve coral reefs and related ecosystems around the world.
- Its decisions are **not binding on its members.**
- The work of ICRI is regularly **acknowledged in United Nations documents**, highlighting the Initiative's important cooperation, collaboration and advocacy role within the international arena.

Objectives

- Encourage the **adoption of best practice in sustainable management** of coral reefs and associated ecosystems
- Build capacity
- Raise **awareness at all levels** on the plight of coral reefs around the world.

What are corals?

- Corals are **marine invertebrates** or animals which do not possess a spine. They are the largest living structures on the planet.
- Each **coral is called a polyp** and thousands of such polyps live together to form a colony, which grows when polyps multiply to make copies of themselves.
- They live in **a symbiotic relationship with microscopic algae** called zooxanthellae (which live within the coral tissue).

- The **zooxanthellae** convert sunlight into food, providing corals with up to 90 per cent of their energy needs.

UNITED NATIONS CONVENTION AGAINST TRANSNATIONAL ORGANISED CRIME

Recently, the union Minister of State for Home Affairs participated in the two-day UN Convention against Transnational Organised Crime Ministerial Conference at Palermo in Italy.

About United Nations Convention against Transnational Organised Crime:

- It is a multinational treaty against transnational organized crime that **was established by the United Nations in 2000.**
- It is often known as the **Palermo Convention**.
- The UNTOC has a total of **147 signatories and 190 parties** to the convention.
- The Convention is further supplemented **by three Protocols**
  - The Protocol to Prevent, Suppress and **Punish Trafficking in Persons, Especially Women and Children;**
  - The Protocol against the **Smuggling of Migrants by Land, Sea and Air**; and
  - The Protocol against the **Illicit Manufacturing of and Trafficking in Firearms**, their Parts and Components and Ammunition.
- **India signed** the UN Convention against Transnational Organized Crime (UNTOC) and its three Protocols on **December 12, 2002.**
- **The Central Bureau of Investigation** (CBI) is the nodal agency for all dealings with UNTOC.

BASOHLI PASHMINA

Recently, Basohli Pashmina, a more than 100-year-old traditional craft from Jammu and Kashmir's Kathua district, has got the Geographical Indication (GI) tag.

About Basohli Pashmina:

- It is a **hand-spun product known for extreme softness**, fineness and light-weight, has insulating properties and extended life.
- Pashmina products include shawls for both men and women, mufflers, blankets and basket.
- Pashmina refers to a **fine variant of spun cashmere** (the animal-hair fibre), that is derived from the downy undercoat of the Changthangi.
- It is obtained from a **breed of mountain goats** (Capra hircus) found on the Changthang Plateau in Tibet and parts of Ladakh.
- A traditional producer of pashmina wool in the Ladakh region are a people known as **the Changpa** (nomadic people inhabit the Changthang plateau of Tibet).

Key facts about Geographical Indication Tag

- It is a sign used on products that have a **specific geographical origin**and possess qualities or a reputation that are due to that origin.
- This is typically used for agricultural products, foodstuffs, wine and spirit drinks, handicrafts and industrial products.
- The Geographical Indications of **Goods (Registration and Protection) Act, 1999**seeks to provide for the registration and better protection of geographical indications relating to goods in India.
- This GI tag is **valid for 10 years** following which **it can be renewed.**

EXERCISE SAMPRITI

India and Bangladesh commenced the 11th edition of exercise SAMPRITI on 03rd October 2023 in Umroi, Meghalaya.

About Exercise SAMPRITI:

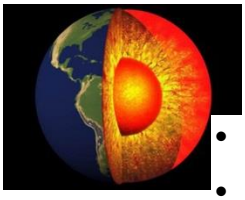
- It is an annual **joint military exercise** between India and Bangladesh.
- It was started in Jorhat, Assam in 2009, the exercise has witnessed ten successful editions till

2022.

- This exercise, **alternatingly organised by both countries**, signifies strong bilateral defence cooperation initiatives.
- SAMPRITI-XI, scheduled for 14 days, will engage approximately 350 personnel from both sides.
- The exercise underscores the importance of **enhancing interoperability** between the two armies, **sharing tactical drills, and promoting best practices**.
- The exercise will also witness **participation by personnel from diverse units** such as artillery, engineers and other supporting arms and services from both sides.
- Centered on the conduct of Sub-Conventional Operations as per Chapter VII of the UN mandate, SAMPRITI-XI will include **a Command Post Exercise** (CPX) and a Field Training **Exercise (FTX), culminating in a Validation Exercise**.
- This exercise promises to further enhance defence cooperation between India and Bangladesh, fostering deeper bilateral relations, cultural understanding, and mutual benefits from shared experiences in Sub Conventional Operations.

KEY FACTS ABOUT EARTH'S INNER CORE

A recent study has found that certain groupings of iron atoms in the Earth's inner core are able to move about rapidly, changing their places in a split second while maintaining the underlying metallic structure of the iron.



About Earth's Inner Core:

- It is the **innermost layer of the Earth.**
- **Structure**:
  - It is a **solid metallic ball** primarily **composed of iron and nickel**.
  - The inner core **is solid due to the pressure caused by the weight put on it** by the Earth's other top layers.
  - It is **distinct from the outer core, which is a liquid.**
- **Depth**:

- The inner core is located at the Earth's center, **approximately 5,150 kilometers (3,219 miles) beneath the Earth's surface**.
- The **boundary between the inner and outer cores is called the Lehman Seismic Discontinuity.**
- **Radius**: The inner core has an **average radius of 1220 km.**
- **Temperature**:
- Inner core temperatures reach **extraordinary levels, estimated to be between 7,200–8,500°F (4,000–4,700°C).**
- The **primary contributors** to the inner core's heat are the **decay of radioactive elements** such as uranium, thorium, and potassium in Earth's crust and mantle, **residual heat from planetary formation**, **and heat emitted by the solidification of the outer core.**

Other Features:

- It is predicted to have very **high thermal and electrical conductivity**.
- The inner core **generates its own magnetic field**.
- Despite its **small volume (less than 1% of the Earth's volume**), the Earth's inner core **contains about 10% of the total magnetic field energy**.
- It plays a **crucial role in outer core liquid motions and the geodynam**o, **which generates the Earth's magnetic field.**
- It **rotates in the same direction** as the surface of the planet **but a bit faster than the rest of the planet.**

What are the different layers of the Earth?

- The earth is made up of **three different layers**: **the crust, the mantle, and the core**.
- **The crust:** This is the **outside layer** of the earth and is **made of solid rock, mostly basalt and granite.**
- **The mantle:**
- It lies **below the crust and is up to 2900 km thick**.
- It consists of **hot, dense, iron and magnesium-rich solid rock**.

- **The core:**
  - It is the **center of the earth** and is **made up of two parts: the liquid outer core and solid inner core.**
  - The **outer core is made of nickel, iron, and molten rock**.

UNLAWFUL ACTIVITIES PREVENTION ACT (UAPA).

Why in news?

- Delhi Police has arrested NewsClick founder and its editor-in-chief Prabir Purkayastha and Amit Chakravarty, firm's human resources head, under the Unlawful Activities (Prevention) Act.
- This was done after the allegations that the portal received funds for pro-China propaganda.

The Unlawful Activities Prevention Act (UAPA), 1967

- Enacted in 1967, UAPA is the primary counter-terror law in India.
- It was enacted to outlaw and penalise unlawful and terrorist activities, which pose a threat to the integrity and sovereignty of India.

Key provisions of UAPA

- **Wide ranging powers to Central Govt**
  - It provides wide-ranging powers to the Central Government to designate organisations as terrorist organisations and
  - It also prescribes the penalties for taking part in the activities of such organisations.
- **Applicability**
  - It is also applicable if the offences are committed outside India.
  - Both Indian and foreign nationals can be charged.
- **Timeline**
  - A charge sheet can be filed in maximum 180 days after the arrests.
  - The investigation has to be completed within 90 days.
  - If investigation is not completed with the stipulated time, the accused is eligible for default bail.
- **Special court**

- The act establishes a special court designated to conduct trials.

2019 Amendment of UAPA

- The original act was amended in the years 2004, 2008, 2013, and 2019 to increase its scope and ambit. 2019 amendment changed the following:
- **Who may commit terrorism**:
  - The amendment additionally empowers the government to designate individuals as terrorists on the same grounds.
- **Approval for seizure of property by NIA**:
  - The Amendment adds that if the investigation is conducted by an officer of the NIA, the approval of the Director General of NIA would be required for seizure of such property.
- **Insertion to schedule of treaties**
  - The Act defines terrorist acts to include acts committed within the scope of any of the treaties listed in a schedule to the Act.
  - The Schedule lists nine treaties, including the Convention for the Suppression of Terrorist Bombings (1997), and the Convention against Taking of Hostages (1979).
  - The Amendment adds another treaty to the list. This is the International Convention for Suppression of Acts of Nuclear Terrorism (2005).

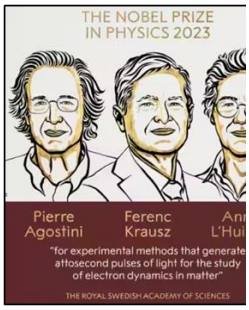
Sanction to prosecute under UAPA

- Section 45(1) of the UAPA says no court shall take cognizance of any offence under the Act without the previous sanction of the central or state government or any officer authorised by them.
- Under Section 45(2), the sanction for prosecution has to be given within a prescribed time only after considering the report by the competent authority.
  - The authority is expected to make an independent review of the evidence gathered by the investigation agency before making a recommendation to the government for the sanction.

NOBEL PRIZE IN PHYSICS 2023

Why in news?

- The Nobel Prize in Physics for 2023 has gone to three scientists - **Anne L'Huillier, Pierre Agostini, and Ferenc Krausz**.
- The work of these scientists made it easier to observe electrons and has potential applications in the field of diagnosing diseases and developing electronic gadgets.



- Anne L'Huillier, Pierre Agostini, and Ferenc Krausz have been awarded the Nobel Prize in Physics for 2023.
- They have given humanity new tools for exploring the world of electrons inside atoms and molecules.
- They have demonstrated a way to create extremely short pulses of light that can be used to measure the rapid processes in which electrons move or change energy.

What exactly have the scientists done?

- An atom, a tiny unit into which matter can be divided, is composed of a nucleus of protons and neutrons, and electrons that travel around this nucleus.
- Electrons move so fast that it is impossible to observe them in real time.
- These three scientists produced **pulses of light that last only attoseconds**, which is **1×10^{-18} of a second**.
- The short pulses of light thus produced can be used to measure the rapid processes in which electrons move or change energy.

A glimpse into Attosecond Physics

- Atoms' natural time scale is incredibly short. In a molecule, atoms can move and turn in millionths of a billionth of a second, known as **femtoseconds (10^{-15} seconds)**.
- But when electrons move inside atoms or molecules, they do it so quickly that changes are blurred out even in a femtosecond.

- In the world of electrons, positions and energies change at speeds of between one and a few hundred attoseconds.
  - **An attosecond is one billionth of a billionth of a second**.
- An attosecond is so short that that the number of them in one second is the same as the number of seconds that have elapsed since the universe came into existence, 13.8 billion years ago
  - On a more relatable scale, we can imagine a flash of light being sent from one end of a room to the opposite wall – this takes ten billion attoseconds.
- This year's laureates conducted experiments that opened up the new research field of attosecond physics.
  - The trio of scientists, in different countries, did the experiments that demonstrated that attosecond pulses could be observed and measured.

How did they do this?

- L'Huillier discovered that when a laser light wave was passed through a noble gas, it interacted with the atoms, giving some electrons extra energy that was then emitted as light.
- Pierre Agostini succeeded in producing and investigating a series of consecutive light pulses [or flashes of light], in which each pulse lasted just 250 attoseconds.
- Ferenc Krausz was working with another type of experiment, one that made it possible to isolate a single light pulse that lasted 650 attoseconds.
- These flashes of light made it possible to provide images of processes inside atoms.

Why is this work important?

- Attosecond physics gives us the opportunity to understand mechanisms that are governed by electrons. The next step will be utilising them.
- One possible application is to study molecular-level changes in blood, to identify diseases.
- A better understanding of how electrons move and transmit energy can also help in creating more efficient electronic gadgets.